

# ICPA project

## Objective

International Comparisons of the Productivity among Asian Countries (China – Korea - Japan - Taiwan)

1st year: Coordination of Data Base and Methodology

2<sup>nd</sup> year: Time-series Comparisons

3<sup>rd</sup> year: PPP, Cross-Country Comparisons

# China & Taiwan Paper

- Basically Same Methodology
- Different Focus

China Paper by Ren Ruoan & Sun Lin Lin  
Economic Reform and Productivity

Taiwan Paper by Chi-Yuan Liang

Counter Evidence to Krugman-Kim-Lau-  
Young Hypothesis

# Data Base

	US	JAPAN	China	Taiwan	Korea
Year	1948-2000	1960-2000	1987-1999	1961-1999	
Sector	35 or more	43		31	
IO	U table	U table	U table	U table	U table
	V table	V table	V table		V table
Labor	168	264	70	72	
Capital			3 or more	6	

# Sector Classification

	USA	Japan	China	Taiwan	Korea
			33 sectors	31 sectors	
1	1.Agriculture	1.Agriculture	1.Agriculture	1.agriculture	
2	3.Coal mining (E)	2.Coal Mining	2.Coal mining	2.coal	
3	2.Metal mining	3.Other Mining	3.Metal & nonmetal mining		
	5.Non-metallic mining				
	4.Oil and gas extraction		4.Oil & Gas mining	3.natural gas	
4	6.Construction (S)	4.Build.&Const.	5.Construction	4.construction	
5	7Food and kindred products	5.Foods	6.Foods	5.food processing	
	8.Tobacco			6.beverage & Tobacco	
6	9.Textile mill products	6.Textile	7.Textiles	7.textiles	
7	10.Apparel	7.Apparel	8.Apparel	8 clothes & wearing apparel	
8	11.Lumber and wood	8.Woods	9.Lumber & Woods	10 wood & furniture prod	
9	12.Furniture and fixtures	9.Furniture	10.Furniture and fixtures		
10	13.Paper and allied	10.Paper&Pulp	11.Paper & allied	11 Paper & Printing	
11	14.Printing, publishing and allied	11.Publishing	12.Printing, Publishing		
12	15.Chemicals	12.Chemical	13.Chemicals	12 chemical & plastic	
13	16.Petroleum and coal products (E)	13.Petroleum 14.Coal Prod.	14.Petroleum & Coal Prod	oil refinery	
14	18.Leaner	16.Leaner Prod.	15.Leaner	9 leather & leather products	
15	19.Stone, clay, glass	17.Stone&Clay	16.Stone,clay glass	14 non-metallic mineral	
16	20.Primary metal	18.Iron&Steel	17.Primary metals	15 basic metal	
		19.Non-ferrous			
17	21.Fabricated metal	20.Metal Prod.	18.Fab. Metal	16 metal products	
18	22.Machinery, non-elect	21.Machinery	19.Machinery	17 machinery & equipment	
19	23.Electrical machinery	22.Elec.Mach.	20.Electric machinery	18 elect. mach. & electronics	
20	24.Motor vehicles	23.Vehicle	21.Moter Vehicles	19 transport equipments	
21	25.Transportation equipment	24.Oth.Trasp.Mach	22.Transp. Equip.		
22	26.Instruments	25.Precision Inst	23.Precision Instruments		
23	17.Rubber and misc plastics	15.Rubber Prod.	24.Rubber & Misc plastic	13 rubber products	
24	27.Misc. manufacturing	26.Misc.Mng.Prod.	25.Other manufacturing	20 miscellaneous	
25	28.Transportation (S)	27.Railway	26.Transp & comm	21Transportation	
		28.Road Trans.			
		29.Water Trans.			
		30.Air Trans.			
		31.Storage			
26	29.Communications	32.Communication	27.Communication		
27	30.Electric utilities (E)	33.Electricity	28.Electric Utilities	22.Electricity	
28	31.Gas utilities (E)	34.Gas	29.Gas Utilities	23.Gas	
		35.Water		24.Water	
29	32.Trade (S)	36.Trade	30.Trade	25.Commerce	
30	33.Finance Insurance and Real (S)	37.Finance	31.Finance,Insur&Real Est	26.Finance & Insurance	
		38.Real Estate			
31	34.Services (S)	42.Other Serv.	32.Other Private Services	27.Personal Services	
32	35.Govt enterprises (S)	39.Education	33.Public Services		
		40.Research			
		41.Medical Serv.			
		43.Public Adm.			

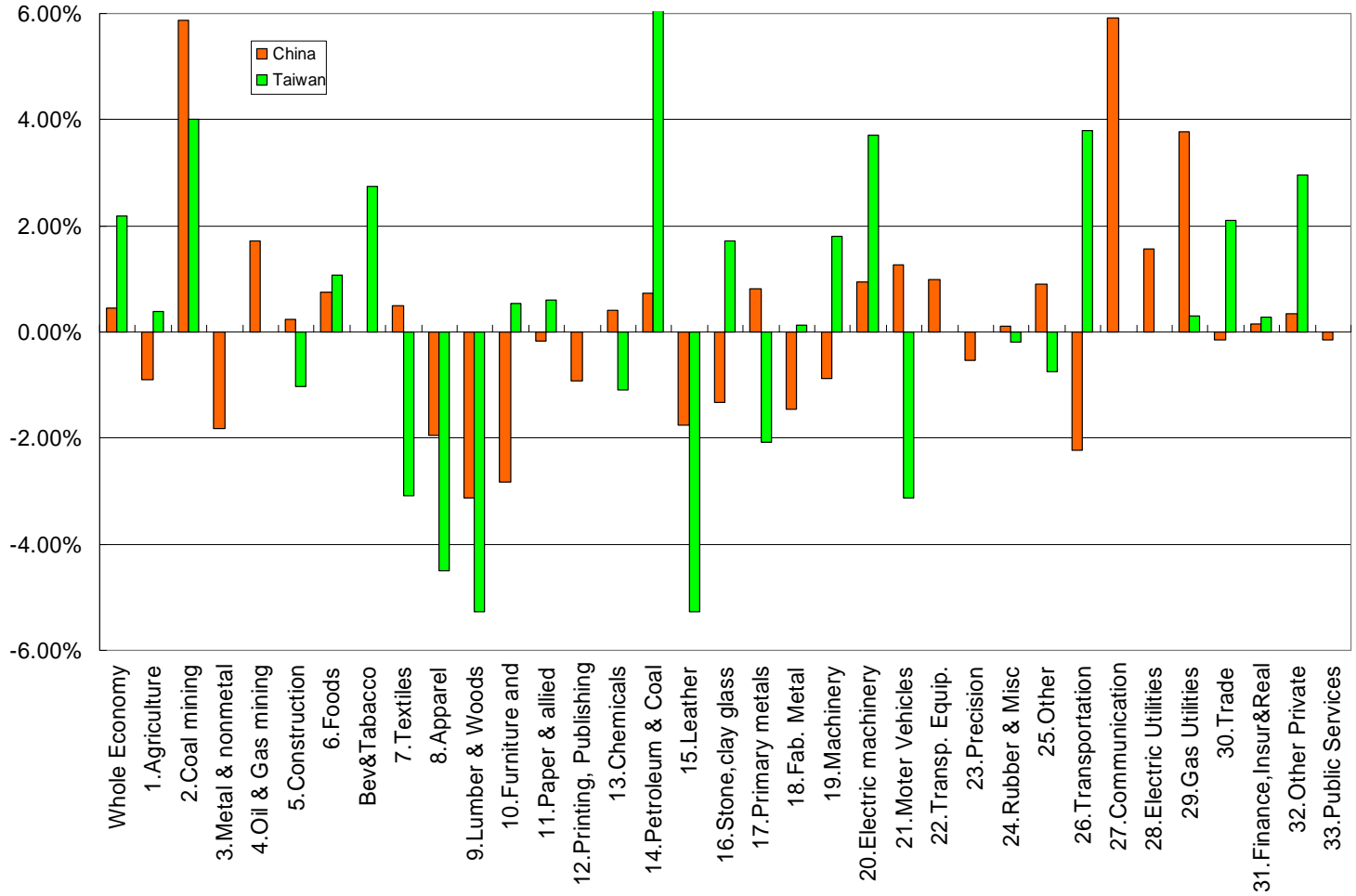
# Labor

	USA	Japan	China	Taiwan	Korea
			70 categories	72 categories	
<b>Gender</b>					
	1.male	1.male	1.male	1.male	1.male
	2.female	2.female	2.female	2.female	2.female
<b>Age</b>					
	1.16-17	1.15-19	1.0-19	1.15-24	1.15-19
	2.18-24	2.20-24	2.20-24		2.20-24
	3.25-34	3.25-29	3.25-29	2.25-34	3.25-29
		4.30-34	4.30-39		4.30-34
	4.35-44	5.35-39		3.35-44	5.35-39
		6.40-44	5.40-49		6.40-44
	5.45-54	7.45-49		4.45-54	7.45-49
		8.50-54	6.50-55		8.50-54
	6.55-64	9.55-59	7.56-	5.55-64	9.55-59
		10.60-64			10.60-64
	7.65-	11.65-		6.65-	11.65-
<b>Education</b>					
			1.Primary School or less		1.under primary school
	1.1-8 years	1.junior high school	2.Junior High School	1.junior high school or less	2.middle school
	2.high school(1-3)	2.high school	3.Other Teriary or Diploma	2.senior or vocational high school	3.high school
	3.high school(4)	3.college/4+high school	4.Senior High School		
	4.college(1-3)		5.University	3.college and above	4.junior&junior tech college
	5.college(4)	4.university			5.university
	6.college(5-)				
<b>Employment status</b>					
	1.wage/salary worker	1.employed		1.employed	
	2.self-employed/unpaid family worker	2.self employed		2.self-employed/unpaid family worker	
		3.unpaid family worker			

# Capital

USA	Japan	China	Taiwan	Korea
Asset class		3 types	6 types	
A1.Owner-occupied residential structure	1.Build.&Const.	A.structure	A1.building	A1.residential building
A2.Tenant occupied residential/nonresidential structure	2.Apparel			A2.nonresidential bulding
	3.Woods		A2.other construction	A3.other construction
B.producers' durable equipment	4.Furniture	B.equipment	B1.machinery	B1.machinery
	5.Non-ferrous		B2.tranportation equipment	B2.transport equipment
	6.Metal Prod.			
	7.Machinery			
	8.Elec.Mach.			
	9.Vehicle			
	10.Oth.Trasp.Mach			
	11.Precision Inst			
	12.Misc.Mng.Prod.			
C.inventry	C.inventry		C.inventry	
D.Land	D.land	D.land	D.land	
E.cuosumers' durable equipment				
Legal form				
1.corporate business	1.private firm			
2.noncorporate business				
3.household				
4.institution	2.public owned enterprise			
	3.Infrastructure			

# TFP growth (1990-99)



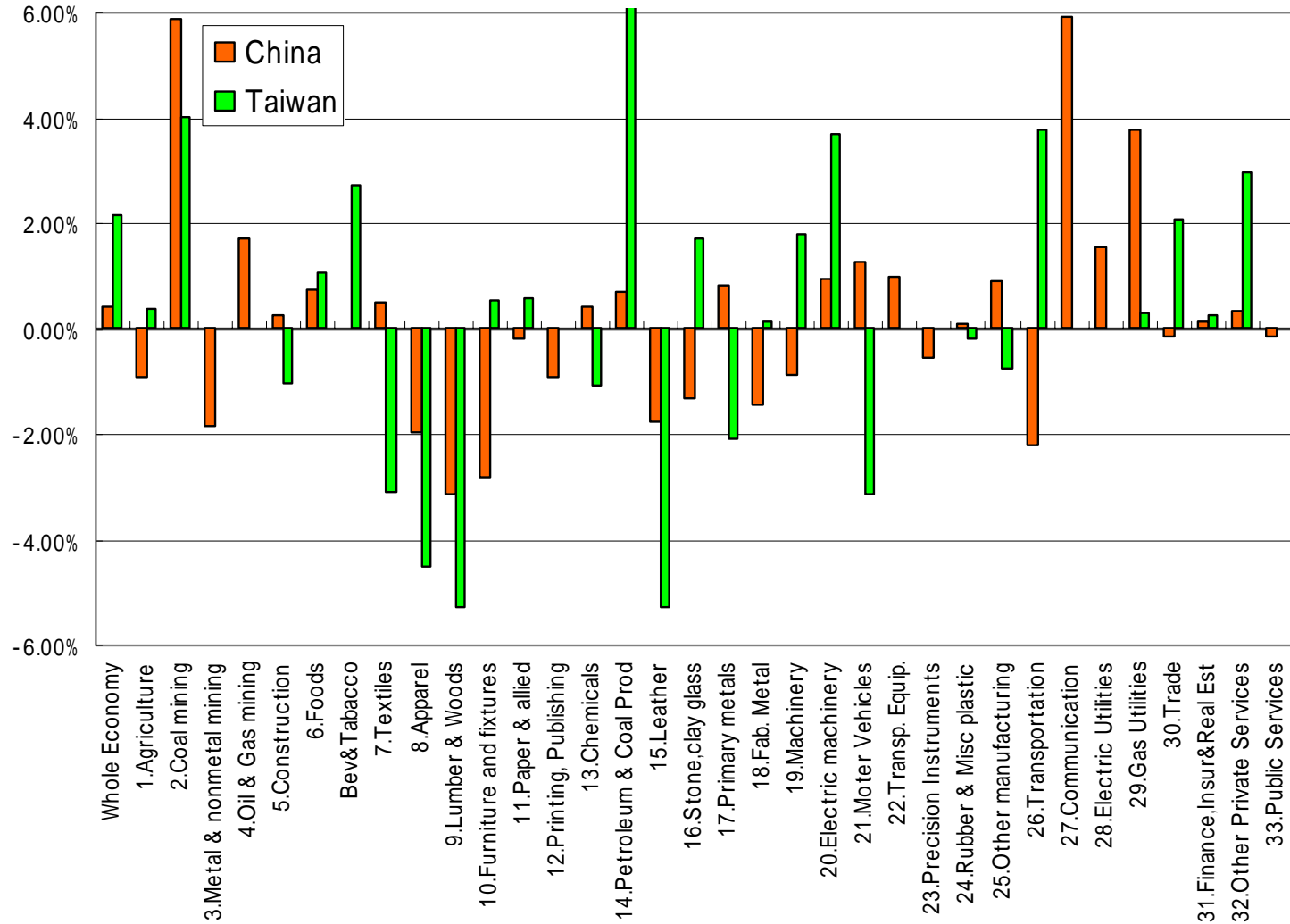
# TFPG

## 90-99

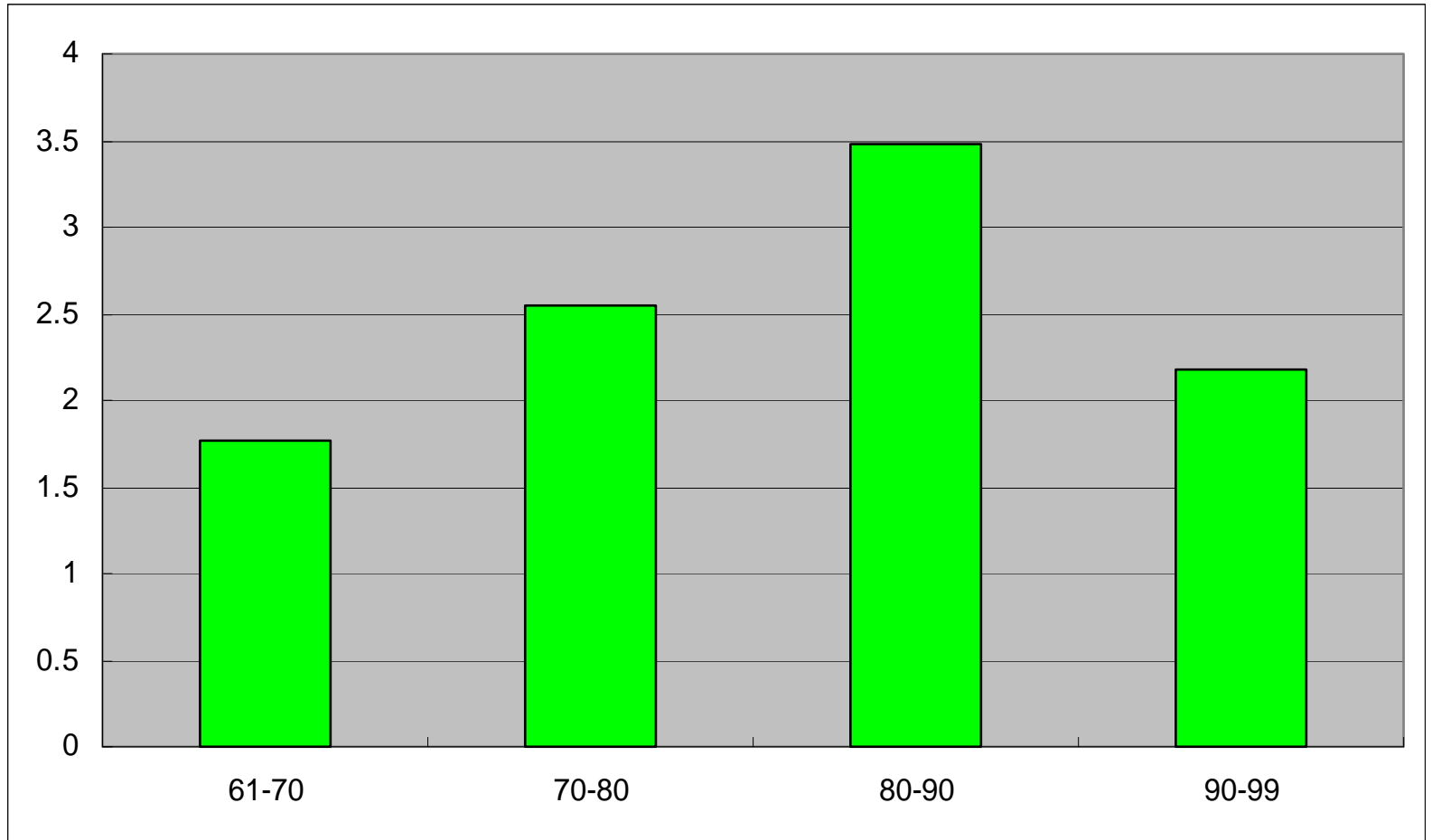
	China	Taiwan
Whole Economy	0.44%	<b>2.18%</b>
1.Agriculture	-0.90%	<b>0.39%</b>
2.Coal mining	5.87%	
3.Metal & nonmetal mining	-1.83%	4.01%
4.Oil & Gas mining	1.70%	
5.Construction	<b>0.24%</b>	-1.02%
6.Foods	0.74%	<b>1.08%</b>
Bev&Tabacco		<b>2.74%</b>
7.Textiles	<b>0.49%</b>	-3.09%
8.Apparel	<b>-1.95%</b>	-4.49%
9.Lumber & Woods	<b>-3.12%</b>	-5.27%
10.Furniture and fixtures	-2.82%	<b>0.53%</b>
11.Paper & allied	-0.17%	
12.Printing, Publishing	-0.91%	<b>0.59%</b>
13.Chemicals	<b>0.42%</b>	-1.09%
14.Petroleum & Coal Prod	0.73%	<b>8.88%</b>
15.Leather	<b>-1.75%</b>	-5.27%
16.Stone,clay glass	-1.32%	<b>1.71%</b>
17.Primary metals	<b>0.81%</b>	-2.07%
18.Fab. Metal	-1.45%	<b>0.13%</b>
19.Machinery	-0.87%	<b>1.79%</b>
20.Electric machinery	0.95%	<b>3.70%</b>
21.Moter Vehicles	<b>1.27%</b>	
22.Transp. Equip.	<b>0.99%</b>	-3.12%
23.Precision Instruments	-0.54%	
24.Rubber & Misc plastic	<b>0.12%</b>	-0.19%
25.Other manufacturing	<b>0.90%</b>	-0.75%
26.Transportation	-2.22%	
27.Communication	5.92%	3.79%
28.Electric Utilities	1.57%	
29.Gas Utilities	<b>3.76%</b>	0.30%
30.Trade	-0.15%	<b>2.10%</b>
31.Finance,Insur&Real Est	0.16%	<b>0.28%</b>
32.Other Private Services	0.33%	<b>2.95%</b>
33.Public Services	-0.16%	



# TFP growth (China)



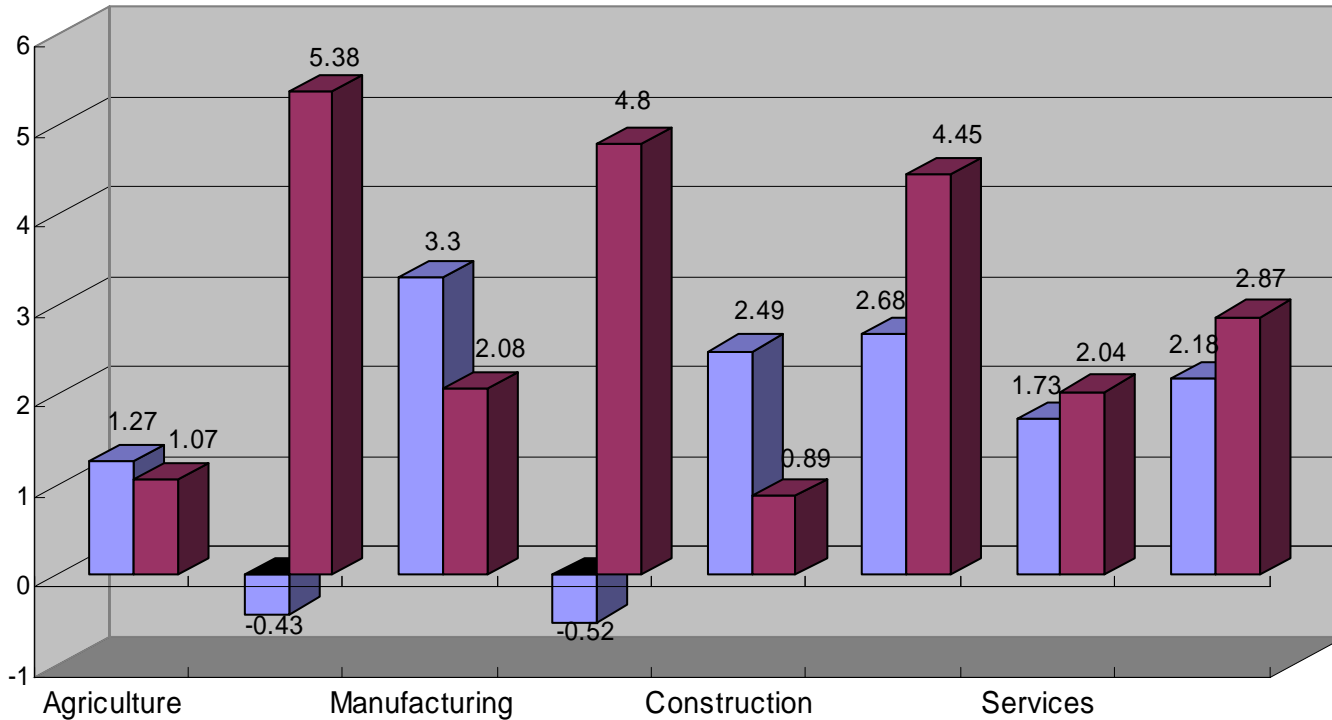
# TFP growth (Taiwan)



# TFP growth by sector

Daigram 1 the Growth of Value Added Total Factor Productivity by Industry during 1961-1999

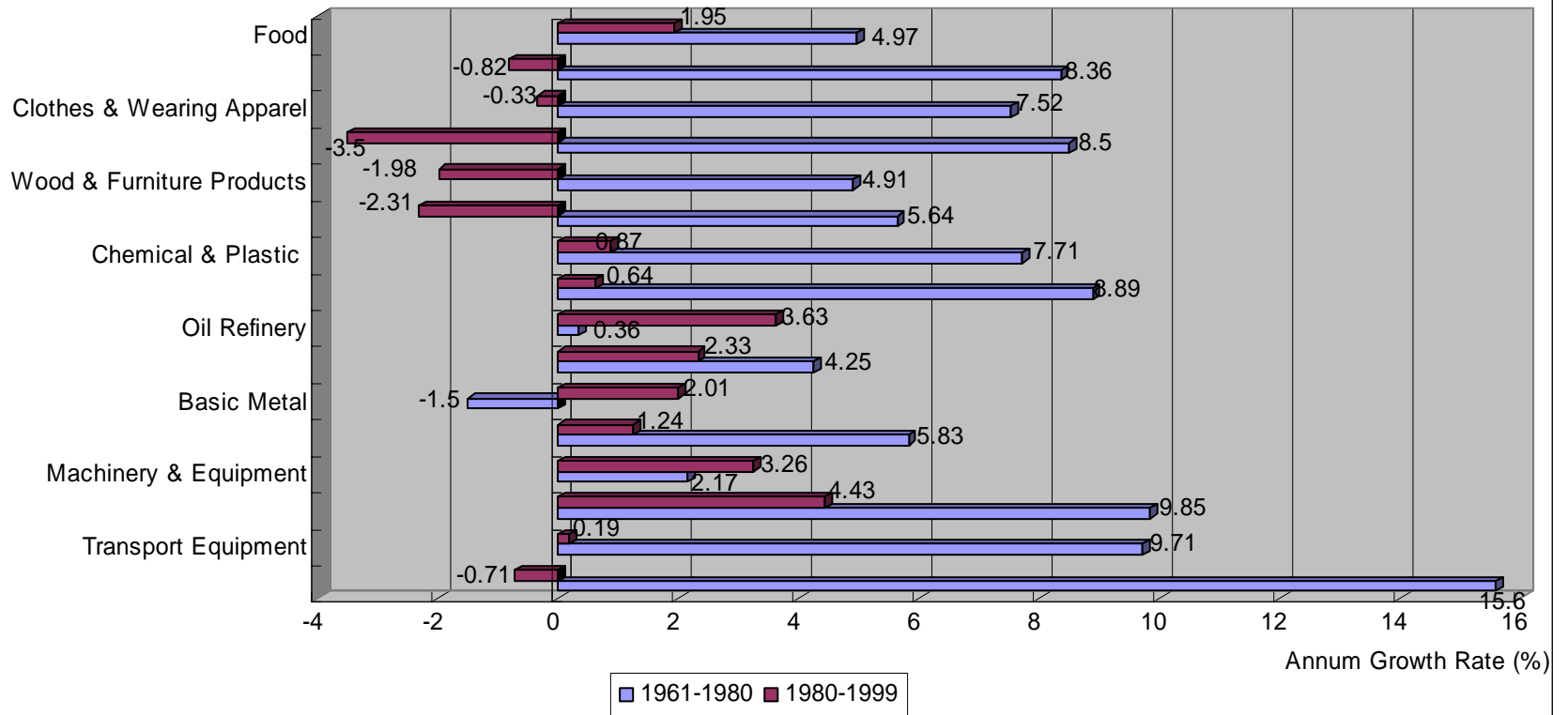
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■ 1961-1980 ■ 1980-1999

# TFP growth (Manufacturing)

Diagram 2 the Growth of Value Added Total Factor Productivity by Manufacturing sector during 1961-1999



# Sources of Economic Growth (Taiwan)

<b>Table 2&amp; 3</b>							
	1961-1999						
		1961-80	1980-1999				
				1961-70	1970-80	1980-90	1990-99
GDPG	8.72	10.51	6.92	10.29	10.71	7.43	6.36
KG	9.51	11.68	7.34	11.42	11.92	6.77	7.98
LG	3.63	5.6	1.66	5.64	5.57	1.91	1.4
TFPG	2.52	2.18	2.87	1.77	2.55	3.48	2.18
TFPG*	1.95	1.74	2.16	1.14	2.28	2.28	2.03
Struct	0.58	0.45	0.71	0.63	0.28	1.2	0.15
K	48%	50%	45%	54%	46%	38%	53%
L	23%	29%	14%	29%	30%	15%	13%
TFPG	29%	21%	41%	17%	24%	47%	34%
TFPG*	77%	80%	75%	64%	89%	66%	93%
Struct	23%	21%	25%	36%	11%	34%	7%
TFPG*=-0.761+0.076**ln(FI/I)+0.089*lnINFRA+0.219**ln(RD/GDP)							
R2=0.957, DW=1.851							
Struct=0.796+0.031**OIL-TEL +0.027**ELEC+0.051**FINA-0.202**lnEXR							
R2=0.934, DW=1.458							